

Supplementary information

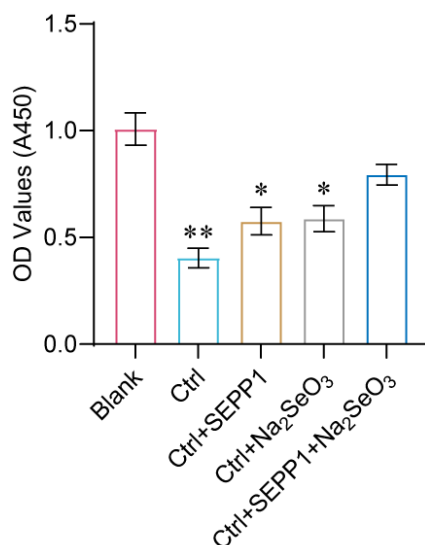
Selenoprotein P attenuates oxidative senescence and ferroptosis-associated lipid peroxidation in dental pulp stem cells through a FOXM1-dependent program

Supplemental Data:

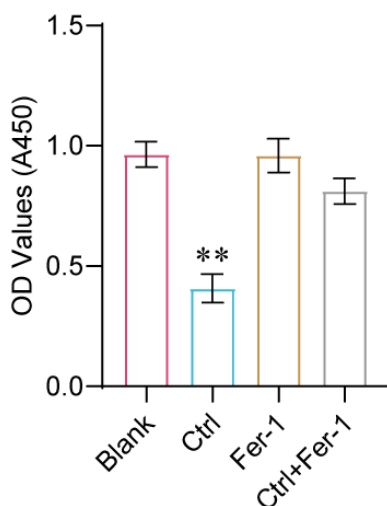
Figures S1-S2

Tables S1, S3-S4

Supplemental Figures



Supplementary Figure S1. Comparison of SEPP1 alone, sodium selenite alone, and SEPP1 + sodium selenite co-treatment in H₂O₂-injured DPSCs. CCK-8 assays were used to assess cell viability under oxidative stress. DPSCs treated with the combined SEPP1 + sodium selenite regimen showed the strongest rescue effect compared with single-agent groups. Data are presented as mean \pm SD (n = 5). *P < 0.05, **P < 0.01.



Supplementary Figure S2. Ferrostatin-1 (Fer-1) rescues cell viability in the H₂O₂-induced oxidative injury model. CCK-8 assays show that Fer-1 significantly improves the viability of H₂O₂-treated DPSCs, supporting the involvement of ferroptosis-associated cell death in this model. Data are presented as mean \pm SD (n = 5). **P < 0.01.

Supplemental Tables

Supplementary Table S1. Donor metadata for human dental pulp tissue samples

Donor ID	Group	Age (years)	Sex	Tooth type	Oral/pulp status	General health status	Assays used
Y01	Young	9	Female	Exfoliated deciduous tooth	Vital pulp; no pulpitis; no periapical lesion	Healthy	H&E, IF
Y02	Young	14	Male	Exfoliated deciduous tooth	Vital pulp; no pulpitis; no periapical lesion	Healthy	IF, qPCR
Y03	Young	19	Female	Impacted third molar	Vital pulp; no pulpitis; no periapical lesion	Healthy	WB, IF, qPCR
Y04	Young	25	Male	Impacted third molar	Vital pulp; no pulpitis; no periapical lesion	Healthy	H&E, IF
A01	Aged	50	Female	Third molar	Vital pulp; no pulpitis; no periapical lesion	Healthy	IF, qPCR
A02	Aged	57	Male	Premolar	Vital pulp; no pulpitis; no periapical lesion	Stable chronic disease	H&E, IF
A03	Aged	63	Female	Third molar	Vital pulp; no pulpitis; no periapical lesion	Healthy	WB, IF, qPCR
A04	Aged	67	Male	Premolar	Vital pulp; no pulpitis; no periapical lesion	Stable chronic disease	IF, qPCR

Supplementary Table S1. Donor metadata for human dental pulp tissue samples used for histological and molecular validation. Only teeth with vital pulp tissue and without acute pulpitis, periapical lesions, or prior endodontic treatment were included. Donor identifiers are de-identified.

Table S3. Primer sequences

Genes	Sequences
<i>FOXM1</i>	F: CGTCGGCCACTGATTCTCAA
	R: GGCAGGGGATCTCTTAGGTT
<i>MYBL2</i>	F: CTTGAGCGAGTCCAAAGACTG
	R: AGTTGGTCAGAAGACTTCCCT
<i>SESN3</i>	F: TACATCCGGTCGTCTGGACAA
	R: AAAACTGGCTCCGCAAGAAAG
<i>CDC20</i>	F: GCTTTGAACCTGAACGGTTT
	R: TCTGGCGCATTTTGTGGTTT
<i>SEPP1</i>	F: AAAGCTCCTTATGTAAGCAACCC
	R: ACAGTCACTGAACCATTGGAGT

Table S4. Antibodies applied in Western blots and immunofluorescence

Antibodies	Sources	Dilution	Incubation
Western blots			
SEPP1	Promab cat# P08749	1:1000	12h at 4°C
P53	Promab cat# 20338	1:1000	12h at 4°C
PCNA	Promab cat# 30453A	1:1000	12h at 4°C
P21	Promab cat# 50623	1:1000	12h at 4°C
P16	Promab cat# 20129	1:1000	12h at 4°C
OCT4	Abcam cat# ab181557	1:1000	12h at 4°C
THY1	Abcam cat# ab133350	1:1000	12h at 4°C
ACTB	Promab cat#20270	1:2000	12h at 4°C
γH2AX	Abcam cat# ab81299	1:500	12h at 4°C
TFRC	Abcam cat# ab214039	1:500	12h at 4°C
GPX4	Abcam cat# ab125066	1:1000	12h at 4°C
FOXMI	Abcam cat# ab245309	1:1000	12h at 4°C
Immunofluorescence			
SEPP1	Promab cat# P08749	1:50	16h at 4°C